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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/710,589 | 07/22/2004 | Tadashi NAKATANI | 040348 | 4588 |

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| EXAMINER | |
|---|---|
| ROJAS, BERNARD | |
| **ART UNIT** | **PAPER NUMBER** |
| 2832 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 03/12/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/710,589 | NAKATANI ET AL. | |
| | Examiner | Art Unit | |
| | Bernard Rojas | 2832 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *3,15 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed 12/20/2006 have been fully considered but they are not persuasive.

Applicant states that Yao teaches a driving electrode 24 provided on the upper surface of the cantilever arm 20 that is directed opposite the base substrate 12, and that the Examiner disregards the fact that the movable contact electrode 22 is provided on the lower surface of the cantilever arm 20. In response, Yao is being used to teach that a driving electrode can be formed on the surface of a cantilever arm that is opposite the base substrate. Aigner discloses the location of the movable contact conductor 71,72 as being located on a surface of a cantilever arm 9 that is opposite the base substrate 1. The combination of forming a driving electrode separate from the cantilever body located on the surface of a cantilever arm that is opposite the base substrate, as shown by Yao, and the contact structure disclosed by Aigner yields the claimed driving electrode/contact structure.

In regards to claim 2, Aigner as modified by Yao as discussed above would provide for the section of the second driving electrode being spaced from the base substrate on a same side as the first driving electrode relative to the base substrate.

### *Claim Rejections - 35 USC § 103*

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2 and 4-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aigner et al. [US 6,734,770] in view of Yao [US 5,578,976].

Claim 1, Aigner et al. discloses a micro-switching device comprising a base substrate [1]; a movable portion [9] including an anchor part [4] and an extending part, the anchor part being connected to the base substrate, the extending part extending from the anchor part and facing the base substrate, wherein the extending part comprises a body having an electrode carrying surface [21,22] on a side opposite to the base substrate; a movable contact conductor [71, 72] provided on the electrode carrying surface of the extending part; a first stationary contact electode [31a, 32a] fixed to the base substrate and including a first contacting part facing the movable contact conductor; and a second stationary contact electrode [31b, 32b] fixed to the base

substrate and including a second contacting part facing the movable contact conductor [figures 1 and 2]; and a first driving electrode [6] on the movable portion.

Aigner fails to teach that the first driving electrode is formed on the electrode carrying surface of the extending part separately from the body of the movable portion.

Yao discloses a MEM switch with a first driving electrode [24] formed separately from the body [20] of the movable portion of the cantilever, located on the surface of the cantilever arm that is opposite the substrate [12].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the first driving electrode of Aigner separately from the body of the movable portion and located on the cantilever arm surface that is opposite the base substrate as shown by Yao, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Claim 2, Aigner et al., as modified, discloses the micro-switching device according to claim 1, further comprising a second driving electrode [51, 52] fixed to the base substrate and including a section facing the first driving electrode said section of the second driving electrode being spaced from the base substrate on a same side as the first driving electrode relative to the base substrate.

Claim 4, Aigner et al. discloses the micro-switching device according to claim 1, wherein the extending part is made of monocrystalline silicon [col. 3 line 62 to col. 4 line 10].

Claim 7, Aigner et al. discloses a micro-switching device comprising a base substrate [1]; a movable portion [9] including an anchor part [4] and an extending part, the anchor part being connected to the base substrate, the part extending from the extending anchor part and facing the base substrate; wherein the extending part comprises a body having an electrode carrying surface [21,22] on a side opposite to the base substrate; a stationary member [2, 11] connected to the base substrate; a movable contact conductor [71, 72] provided on the electrode carrying surface of the extending part; a first stationary contact electrode [31a, 32a] connected to the stationary member and including a first contacting part facing the movable contact conductor; a second stationary contact electrode [31b, 32b] connected to the stationary member and including a second contacting part facing the movable contact conductor [figures 1 and 2]; and a first driving electrode [6] on the movable portion.

Aigner fails to teach that the first driving electrode is formed on the electrode carrying surface of the extending part separately from the body of the movable portion.

Yao discloses a MEM switch with a first driving electrode [24] formed separately from the body [20] of the movable portion of the cantilever, located on the surface of the cantilever arm that is opposite the substrate [12].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the first driving electrode of Aigner separately from the body of the movable portion and located on the cantilever arm surface that is opposite the base substrate as shown by Yao, since it has been held that constructing a formerly

integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Claim 8, Aigner et al. discloses the micro-switching device according to claim 7, wherein the stationary member is spaced away from the movable portion [figures 1 and 2].

Claim 9, Aigner et al. discloses the micro-switching device according to claim 7, wherein the stationary member surrounds the movable portion [figure 1].

Claim 10, Aigner et al. discloses the micro-switching device according to claim 7, wherein the stationary member includes a plurality of stationary island parts that are spaced away from one another and are each connected to the base substrate [figure 1].

Claim 11, Aigner et al. discloses the micro-switching device according to claim 7, further comprising a second driving electrode [53, 54] connected to the stationary member and including a section facing the first driving electrode [figure 3].

Claim 12, Aigner et al. discloses the micro-switching device according to claim 7, wherein the extending part is made of monocrystalline silicon [col. 3 line 62 to col. 4 line 10].

Claims 5 and 13, Aigner et al. discloses the claimed invention except for the thickness of the contact electrode. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the contact electrode to minimize signal distortion depending on the voltage and/or frequency of the signal. Since applicant has not disclosed that a contact electrode thickness of at least 5

micrometer solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well as taught by Aigner et al.

Claims 6 and 14, Aigner et al. discloses the claimed invention except for the thickness of the extending part. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the thickness of the extending part in order to change the spring characteristic/response time/opening force [i.e. thick = slower response time and greater opening force, smaller equals faster actuation time and small opening force] of the moveable part. Since applicant has not disclosed that a extending part thickness of at least 5 micrometer solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well as taught by Aigner et al.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M and W-F, 5:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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